Effectiveness of pozzolan in preventing expansion due to alkali-aggregate reaction and its mechanism

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1986 Fiscal Year Final Research Report Summary

EFFECTIVENESS OF POZZOLAN IN PREVENTING EXPANSION DUE TO ALKALI-AGGREGATE REACTION AND ITS MECHANISM

Research Project

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| Research Institution |
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| Project Period (FY) |
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| POZZOLAN / ALKALI-SILICA EXPANSION / PREVENTION / ALKALI CONCENTRATION / PORE SOLUTION / アルカリ濃度 |
| Research Abstract |

^{1.}THE EFFECT OF POZZOLAN ON THE PREVENSION OF ALKALI-SILICA EXPANSION IS FOUND TO LARGELY DEPEND UPON THE TYPE OF POZZOLAN AND REACTIVE AGGREGATE, ALKALI CONCENTRATION OF THE PORE SOLUTION AND CONTENT OF POZZOLAN IN MORTARS. THEREFOR, THE EFFECTS OF ALL POZZOLANS ON ALKALI-SILICA EXPANSION CAN NOT BE TOTALLY EXPLAINED BY ONE OF SOME MECHANISMS.

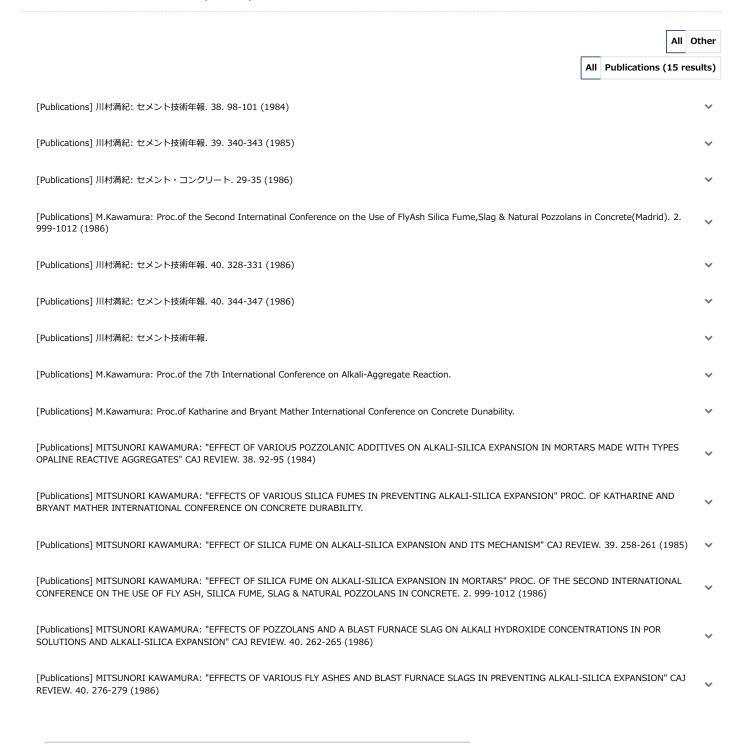
^{2.}IN THE MORTARS MADE WITH BELTANE OPAL AS A REACTIVE AGGREGATE, IF THE AMOUNT OF CEMENT REPLACED BY FLY ASHES OR BLAST FURNACE SLAGS IN JAPAN IS MORE THAN 25% OR 60% BY WEIGHT, RESPECTIVELY, ALKALI-SILICA EXPANSION CAN BE PREVENTED.

PREVENTIVE ABILITY OF FLY ASHES OR BLAST FURNACE SLAGS IN JAPAN AGAINST THE ALKALI-SILICA EXPANSION CORRELATES WITH THE REDUCED

ALKALINITY IN PORE SOLUTION DUE TO THEIR ADDITION.

- 3.SOME FACTORS OTHER THAN REDUCED ALKALINITY IN PORE SOLUTION ALSO APPEAR TO BE RELATED TO THE PREVENTION OR REDUCTION OF EXPANSION DUE TO ALKALI-SILICA REACTION BY INCORPORATION OF SOME POZZOLANS.
- 4.ADDITION OF RELATIVELY SMALL AMOUNT OF SILICA FUME WHICH IS EXPECTED TO HAVE A POSSIBILITY OF PREVENTING ALKALI-SILICA EXPANSION FOR ITS HIGH POZZOLANIC ACTIVITY WAS FOUND TO ENHANCE EXPANSION OF MORTARS. THIS ENHANCEMENT OF EXPANSION IS ATTRIBUTABLE TO THE DELAY IN SOFTENING OF THE GELS FORMED IN THE SILICA FUME-BEARING MORTARS.

Research Products (15 results)



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